January 2003

Test 1822: Challenger MT745 Diesel

NEBRASKA OECD TRACTOR TEST 1822–SUMMARY 399
CHALLENGER MT745 DIESEL
16 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP *(kW)*	Crank shaft speed rpm	Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1060 rpm)					
207.93 *(155.05)*	2100	12.07 *(45.70)*	0.405 *(0.247)*	17.22 *(3.39)*	
Standard Power Take-off Speed - (PTO speed - 1000 rpm)					
220.81 *(164.66)*	1982	12.23 *(46.29)*	0.387 *(0.235)*	18.06 *(3.56)*	
Maximum Power (2 hours)					
236.19 *(176.13)*	1700	12.37 *(46.83)*	0.366 *(0.222)*	19.09 *(3.76)*	
VARYING POWER AND FUEL CONSUMPTION					
207.93 *(155.05)*	2100	12.07 *(45.70)*	0.405 *(0.247)*	17.22 *(3.39)*	Air temperature
182.93 *(136.41)*	2177	11.30 *(42.78)*	0.431 *(0.262)*	16.19 *(3.19)*	75°F *(24°C)*
138.38 *(103.19)*	2200	9.50 *(35.95)*	0.479 *(0.291)*	14.57 *(2.87)*	Relative humidity
92.46 *(68.95)*	2201	7.61 *(28.79)*	0.574 *(0.349)*	12.16 *(2.39)*	51%
46.50 *(34.67)*	2201	5.46 *(20.66)*	0.819 *(0.498)*	8.52 *(1.68)*	Barometer
2.11 *(1.58)*	2201	3.52 *(13.34)*	11.640 *(7.080)*	0.60 *(0.12)*	28.49" Hg *(96.49 kPa)*

Maximum Torque - 804 lb.-ft. *(1090 Nm)* at 1200 rpm
Maximum Torque Rise - 54.7%
Torque rise at 1700 engine rpm - 40%

DRAWBAR PERFORMANCE (Unballasted)
FUEL CONSUMPTION CHARACTERISTICS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp.°F *(°C)* cool-ing med	Temp.°F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—6th Gear									
177.67 *(132.49)*	15116 *(67.24)*	4.41 *(7.09)*	2098	2.42	0.477 *(0.290)*	14.64 *(2.88)*	181 *(83)*	53 *(12)*	28.93 *(97.97)*
75% of Pull at Maximum Power—6th Gear									
140.78 *(104.98)*	11323 *(50.36)*	4.66 *(7.50)*	2200	1.50	0.537 *(0.327)*	13.01 *(2.56)*	180 *(82)*	64 *(18)*	28.95 *(98.04)*
50% of Pull at Maximum Power—6th Gear									
94.61 *(70.55)*	7556 *(33.61)*	4.70 *(7.56)*	2199	0.71	0.634 *(0.386)*	11.01 *(2.17)*	180 *(82)*	68 *(20)*	28.95 *(98.04)*
75% of Pull at Reduced Engine Speed—9th Gear									
140.72 *(104.93)*	11328 *(50.39)*	4.66 *(7.50)*	1541	1.58	0.460 *(0.280)*	15.19 *(2.99)*	182 *(83)*	66 *(19)*	28.95 *(98.04)*
50% of Pull at Reduced Engine Speed—9th Gear									
94.63 *(70.57)*	7563 *(33.64)*	4.69 *(7.55)*	1539	0.71	0.511 *(0.311)*	13.68 *(2.69)*	181 *(83)*	69 *(21)*	28.93 *(97.97)*

Location of Test: Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832

Dates of Test: April 16-May 19, 2003

Manufacturer: AGCO Corp, 4205 River Green Parkway, Duluth Ga 30096

FUEL, OIL and TIME: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F *(15°/15°C)*** 0.8386 **Fuel weight** 6.982 lbs/gal *(0.837 kg/l)* **Oil SAE** 10W-30 **API service classification** CH-4 **Transmission and hydraulic lubricant** Caterpillar MTO fluid **Total time engine was operated:** 28.5 hours

ENGINE: Make Caterpillar Diesel **Type** six cylinder vertical with turbocharger and air to air aftercooler **Serial No.***4ZF04281* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.409" x 5.866" *(112.0 mm x 149.0 mm)* **Compression ratio** 16.0 to 1 **Displacement** 537 cu in *(8810 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and water separator **Muffler** vertical **Cooling medium temperature control** 1 thermostat

ENGINE OPERATING PARAMETERS: Fuel rate: 81.2 - 90.4 lb/h *(36.8 - 41.0 kg/h)* **High idle:** 2175 - 2225 rpm **Turbo boost:** nominal 16.7 - 21.0 psi *(115 - 145 kPa)* as measured 17.5 psi *(120 kPa)*

CHASSIS: Type tracklayer-rubber tracked **Serial No.***AGCMT745PALA30220* **Track width** 88.0" *(2235 mm)* to 119.5 *(3035 mm)* **Length of track on ground** 102.4" *(2600 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled power shift **Nominal travel speeds mph *(km/h)*** first 1.66 *(2.67)* second 2.11 *(3.40)* third 2.66 *(4.28)* fourth 3.38 *(5.44)* fifth 4.03 *(6.49)* sixth 4.54 (7.*31)* seventh 5.12 *(8.24)* eighth 5.76 *(9.27)* ninth 6.48 *(10.43)* tenth 7.29 *(11.73)* eleventh 8.22 *(13.23)* twelfth 9.26 *(14.90)* thirteenth 11.02 *(17.73)* fourteenth 14.00 *(22.53)* fifteenth 17.72 *(28.52)* sixteenth 24.64 *(39.65)* at 2300 rpm, reverse 1.33 *(2.14)*, 3.22 *(5.18)*, 3.63 *(5.84)*, 8.82 *(14.19)* **Clutch** wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically actuated foot pedal **Steering** electro-hydraulic differential steering controlled by steering wheel **Power take-off** 1000 rpm at 1980 engine rpm **Unladen tractor mass** 28020 lb *(12710 kg)*

DRAWBAR PERFORMANCE
Unballasted at 2100 RPM
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp.°F *(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
					2nd Gear				
132.17	26433	1.88	2192	14.32	0.604	11.56	179	44	28.94
(98.56)	*(117.58)*	*(3.02)*			*(0.367)*	*(2.28)*	*(82)*	*(7)*	*(98.00)*
					3rd Gear				
158.25	25088	2.37	2102	10.88	0.536	13.03	180	47	28.95
(118.00)	*(111.59)*	*(3.81)*			*(0.326)*	*(2.57)*	*(82)*	*(8)*	*(98.04)*
					4th Gear				
164.24	19277	3.20	2096	4.96	0.513	13.62	180	63	28.94
(122.48)	*(85.75)*	*(5.14)*			*(0.312)*	*(2.68)*	*(82)*	*(17)*	*(98.00)*
					5th Gear				
174.10	16811	3.88	2100	3.26	0.484	14.42	181	63	28.95
(129.83)	*(74.78)*	*(6.25)*			*(0.294)*	*(2.84)*	*(83)*	*(17)*	*(98.04)*
					6th Gear				
177.67	15116	4.41	2098	2.42	0.477	14.64	181	53	28.93
(132.49)	*(67.24)*	*(7.09)*			*(0.290)*	*(2.88)*	*(83)*	*(12)*	*(97.97)*
					7th Gear				
173.75	13036	5.00	2097	1.65	0.486	14.37	181	55	28.94
(129.56)	*(57.99)*	*(8.04)*			*(0.296)*	*(2.83)*	*(83)*	*(13)*	*(98.00)*
					8th Gear				
173.78	11519	5.66	2100	1.42	0.485	14.40	181	58	28.94
(129.59)	*(51.24)*	*(9.10)*			*(0.295)*	*(2.84)*	*(83)*	*(14)*	*(98.00)*
					9th Gear				
170.49	10044	6.37	2096	1.03	0.497	14.05	181	50	28.93
(127.13)	*(44.68)*	*(10.24)*			*(0.302)*	*(2.77)*	*(83)*	*(10)*	*(97.97)*
					10th Gear				
168.87	8792	7.20	2101	0.95	0.498	14.03	181	60	28.95
(125.93)	*(39.11)*	*(11.59)*			*(0.303)*	*(2.76)*	*(83)*	*(16)*	*(98.04)*
					11th Gear				
161.16	7424	8.14	2102	0.63	0.523	13.36	181	62	28.96
(120.17)	*(33.02)*	*(13.10)*			*(0.318)*	*(2.63)*	*(83)*	*(17)*	*(98.07)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests the fuel temperature at the injection pump inlet was maintained at 118°F *(48°C)*. The performance figures on this summary were taken from a test conducted under the OECD Code II test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1822**, Nebraska Summary 399, June 12, 2003.

Leonard L. Bashford
Director

M.F. Kocher
V.I. Adamchuk
W.P. Campbell
Board of Tractor Test Engineers

TRACTOR SOUND LEVEL WITH CAB	**dB(A)**
At no load in 6th gear	74.7
Bystander	--

TIRES, BALLAST AND WEIGHT	**With Ballast**	**Without Ballast**
Track width	18.0 in *(455 mm)*	18.0 in *(455 mm)*
Ballast - Cast iron(front)	670 lb *(304 kg)*	None
- Cast iron(front idlers)	1760 lb *(798 kg)*	None
Height of Drawbar	20.5 in (*520 mm)*	20.5 in (*520 mm)*
Static Weight with operator	30625 lb(*13891 kg)*	28195 lb(*12789 kg)*

DRAWBAR PERFORMANCE
(Unballasted at 1700 RPM)
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp.°F*(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
					2nd Gear				
133.58	26932	1.86	2185	14.72	0.601	11.62	180	44	28.94
(99.61)	*(119.80)*	*(2.99)*			*(0.365)*	*(2.29)*	*(82)*	*(7)*	*(98.00)*
					3rd Gear				
159.30	25240	2.37	2100	10.81	0.533	13.09	180	47	28.95
(118.79)	*(112.27)*	*(3.81)*			*(0.324)*	*(2.58)*	*(82)*	*(8)*	*(98.04)*
					4th Gear				
173.57	23288	2.80	1942	9.98	0.497	14.06	181	64	28.93
(129.43)	*(103.59)*	*(4.50)*			*(0.302)*	*(2.77)*	*(83)*	*(18)*	*(97.97)*
					5th Gear				
184.89	21371	3.24	1842	7.43	0.466	14.98	181	65	28.92
(137.87)	*(95.06)*	*(5.22)*			*(0.283)*	*(2.95)*	*(83)*	*(18)*	*(97.93)*
					6th Gear				
192.04	21316	3.38	1705	7.64	0.451	15.50	181	66	28.91
(143.20)	*(94.82)*	*(5.44)*			*(0.274)*	*(3.05)*	*(83)*	*(19)*	*(97.90)*
					7th Gear				
197.85	18772	3.95	1702	4.37	0.439	15.91	182	63	28.95
(147.54)	*(83.50)*	*(6.36)*			*(0.267)*	*(3.13)*	*(83)*	*(17)*	*(98.04)*
					8th Gear				
203.11	16934	4.50	1697	3.03	0.427	16.36	182	54	28.93
(151.46)	*(75.33)*	*(7.24)*			*(0.260)*	*(3.22)*	*(83)*	*(12)*	*(97.97)*
					9th Gear				
200.22	14719	5.10	1700	2.35	0.433	16.12	182	57	28.94
(149.31)	*(65.47)*	*(8.21)*			*(0.263)*	*(3.18)*	*(83)*	*(14)*	*(98.00)*
					10th Gear				
202.48	13147	5.78	1700	1.73	0.429	16.27	182	52	28.93
(150.99)	*(58.48)*	*(9.30)*			*(0.261)*	*(3.20)*	*(83)*	*(11)*	*(97.97)*
					11th Gear				
195.26	11176	6.55	1702	1.26	0.445	15.70	182	63	28.95
(145.61)	*(49.71)*	*(10.54)*			*(0.270)*	*(3.09)*	*(83)*	*(17)*	*(98.04)*
					12th Gear				
196.84	9955	7.42	1707	1.11	0.440	15.88	182	61	28.95
(146.78)	*(44.28)*	*(11.93)*			*(0.267)*	*(3.13)*	*(83)*	*(16)*	*(98.04)*
					13th Gear				
194.03	8264	8.81	1698	0.86	0.443	15.75	182	62	28.96
(144.69)	*(36.76)*	*(14.17)*			*(0.270)*	*(3.10)*	*(83)*	*(17)*	*(98.07)*

DRAWBAR PERFORMANCE
(Ballasted at 1700 RPM)
MAXIMUM POWER IN SELECTED GEARS

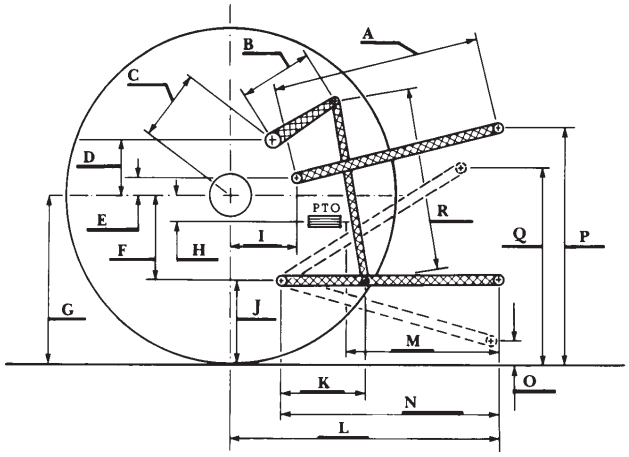
Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp.°F*(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
				2nd Gear					
141.73 *(105.69)*	28555 *(127.02)*	1.86 *(3.00)*	2160	13.57	0.573 *(0.349)*	12.18 *(2.40)*	180 *(82)*	54 *(12)*	28.79 *(97.49)*
				3rd Gear					
164.06 *(122.34)*	26239 *(116.71)*	2.34 *(3.77)*	2064	9.94	0.520 *(0.316)*	13.43 *(2.65)*	181 *(83)*	57 *(14)*	28.82 *(97.60)*
				4th Gear					
178.77 *(133.31)*	23808 *(105.90)*	2.82 *(4.53)*	1916	8.42	0.485 *(0.295)*	14.40 *(2.84)*	181 *(83)*	69 *(21)*	28.69 *(97.16)*
				5th Gear					
190.16 *(141.80)*	22648 *(100.74)*	3.15 *(5.07)*	1779	7.33	0.455 *(0.277)*	15.33 *(3.02)*	181 *(83)*	69 *(21)*	28.69 *(97.16)*
				6th Gear					
197.10 *(146.97)*	21428 *(95.31)*	3.45 *(5.55)*	1700	5.57	0.439 *(0.267)*	15.91 *(3.13)*	182 *(83)*	68 *(20)*	28.70 *(97.19)*
				7th Gear					
198.10 *(147.73)*	18777 *(83.52)*	3.96 *(6.37)*	1698	3.90	0.436 *(0.265)*	16.03 *(3.16)*	182 *(83)*	66 *(19)*	28.70 *(97.19)*
				8th Gear					
201.50 *(150.26)*	16762 *(74.56)*	4.51 *(7.26)*	1700	2.92	0.431 *(0.262)*	16.19 *(3.19)*	181 *(83)*	65 *(18)*	28.70 *(97.19)*
				9th Gear					
200.62 *(149.60)*	14706 *(65.42)*	5.12 *(8.23)*	1703	2.16	0.435 *(0.265)*	16.05 *(3.16)*	181 *(83)*	60 *(16)*	28.70 *(97.19)*
				10th Gear					
201.68 *(150.39)*	13088 *(58.22)*	5.78 *(9.30)*	1701	1.69	0.431 *(0.262)*	16.19 *(3.19)*	182 *(83)*	61 *(16)*	28.70 *(97.19)*
				11th Gear					
195.20 *(145.56)*	11193 *(49.79)*	6.54 *(10.52)*	1699	1.23	0.442 *(0.269)*	15.79 *(3.11)*	182 *(83)*	62 *(17)*	28.70 *(97.19)*
				12th Gear					
194.61 *(145.12)*	9898 *(44.03)*	7.37 *(11.87)*	1701	1.15	0.444 *(0.270)*	15.72 *(3.10)*	182 *(83)*	63 *(17)*	28.70 *(97.19)*
				13th Gear					
192.10 *(143.25)*	8191 *(36.43)*	8.80 *(14.15)*	1696	0.75	0.450 *(0.274)*	15.53 *(3.06)*	182 *(83)*	64 *(18)*	28.70 *(97.19)*

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: III
Quick Attach: yes

Maximum Force Exerted Through Whole Range:	17263 lbs *(76.8 kN)*
i) Opening pressure of relief valve:	NA
Sustained pressure at compensator cutoff:	2855 psi *(197 bar)*
ii) Pump delivery rate at minimum pressure and rated engine speed:	43.8 GPM *(165.8 l/min)*
iii)Pump delivery rate at maximum hydraulic power:	41.5 GPM *(157.1 l/min)*
Delivery pressure:	2750 psi *(190 bar)*
Power:	66.6 HP *(49.7 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD



	inch	*mm*
A	27.6	*702*
B	21.7	*550*
C	23.5	*596*
D	23.0	*583*
E	11.4	*290*
F	11.8	*300*
G	33.4	*849*
H	1.3	*34*
I	16.7	*425*
J	21.6	*549*
K	27.1	*688*
L	48.4	*1230*
*L'	52.2	*1325*
M	27.9	*709*
N	39.6	*1005*
O	9.0	*230*
P	48.6	*1234*
Q	40.2	*1022*
R	42.5	*1079*

*L' to Quick Attach ends

CHALLENGER MT745 DIESEL

Agricultural Research Division
Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln
Darrell Nelson, Dean and Director